



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/814,425 | 03/21/2001 | Everett X. Wang | 42390.P11004 | 4061 |

7590 02/25/2005

Dennis M. de Guzman
BLAKELY, SOKOLOFF TAYLOR & ZAFMAN LLP
Seventh Floor
12400 Wilshire Boulevard
Los Angeles, CA 90025-1026

| EXAMINER |
|----------|
|----------|

MOONEY, MICHAEL P

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2883

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary

Application No.

09/814,425

Applicant(s)

WANG ET AL.

Examiner

Michael P. Mooney

Art Unit

2883

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 11/29/04 Amdt.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4,7,16-19 and 22 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-4,7,16-19 and 22 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date <u>9/13/04</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

The drawings were received on 11/29/04. These drawings are acceptable.

Response to Arguments

Applicant's arguments filed 11/29/04 have been fully considered but they are not persuasive. The rejection of the 3/21/01 version of claim 1 in the 8/25/04 Office action was proper because each and every element of the 3/21/01 version of claim 1 is taught by Shinobu. See the 8/25/04 Office action.

Furthermore, the rejection of claim 16 in the 8/25/04 Office action was proper because each and every element of claim 16 is taught by Shinobu. The progression of the fabrication shown in Shinobu figs. 2-4 teaches a layer made of a second cladding material 19 and formed over the core material and over the first cladding material, including over the spacing. It is noted that element number 19 of figure 4(b) is inherently a cladding.

Thus, Applicant's arguments with respect to the 8/25/04 rejection of the 3/21/01 version claims 1 and 16 have been refuted.

Furthermore, the 11/29/04 (Amended) version of claim 1 is rejected infra. The rejection infra refutes the Applicant's arguments in the 11/29/04 Remarks with respect to the new 11/29/04 version of claim 1. It is noted that this rejection is necessitated by amendment.

Additionally, all of the dependent claims are also rejected by virtue of dependence on a rejected base claim and/or by virtue of the features therein. See the rejection *infra*.

The "notoriously well known" (NWK) statements made in the 8/25/04 Office action are valid. Although Applicant asserts that "using a chemical-mechanical process to remove excess core material" is subject matter which contributes to rendering the newly amended claim 1 allowable (see 11/29/04 Remarks page 5 in the last paragraph), using a chemical-mechanical process (CMP) to remove excess core material is obvious because such CMPs are commonly employed in semiconductor processes and are capable of instant and unquestionable demonstration as being well known.

In Applicant's 11/29/04 Remarks at the top paragraph of page 6, Applicant states that Shinobu does not teach "...in the Figure [4(b)] regarding what material the layer 19 is made from, and the English abstract also does not explain what layer 19 is made from." Applicant further states that the Shinobu figures do not clearly show a process combination including, "forming another cladding material over the core regions and over the spacing" as stated at the end of newly amended claim 1.

On the contrary, relying solely on Shinobu's disclosure in the Figures and the English abstract, one of ordinary skill in the art must readily conclude that the natural progression in Shinobu figures 2-4 and culminating at figure 4(b); clearly teaches that element 19 is indeed a cladding layer. Furthermore, it is extremely clear in figure 4(b) that upper cladding element 19 is "formed over the core regions and over the spacing". Thus, every element of the claim phrase "forming another cladding material over the

Art Unit: 2883

core regions and over the spacing" is taught in Shinobu unless there is some special meaning that should be associated with the phrase "another cladding material".

In order to determine if there is some special meaning to the phrase "another cladding material" in reference the upper cladding, the instant Specification has been carefully examined. The most clear statement(s) in the Specification with regard to what material the upper cladding is made of teach that the upper cladding is made of material capable of being deposited and/or reflowed, and, at claim 17, that the 1st and 2nd cladding materials can be "similar" and may have a lower refractive index than the core. The aforementioned statements (i.e., those statements in the previous sentence) with respect to the upper cladding material are completely consistent with the prior art techniques that are notoriously well known for use in making invention(s) such as described in figs. 2-4 and the English abstract of Shinobu. The aforementioned statements are also consistent with the statements in this Office action and the previous Office action regarding rejecting the instant claims.

Additionally, it is noted that a "similar" material does not have to be exactly the same; it just must be "similar" in some way. One of ordinary skill in the art can look at Shinobu figure 4(b) and note that the material of upper cladding 19 is similar to the material of lower cladding material 13 in that both materials were deemed to be appropriate cladding materials that touch the same core(s). This would make it ridiculously erroneous to even consider that "another cladding material", interpreted in light of the instant Spec., could render the instant claims allowable over Shinobu's invention.

Art Unit: 2883

It is noted that the findings infra are consistent with the International Search Report (ISR), mailed on 6/2/03, which designates Shinobu as an "X-reference". Applicant submitted to the Office a copy of the Shinobu X-reference and the associated English abstract text on 6/16/03.

Finally, the Office maintains that the said NWK statements are correct and, therefore, do not bar making this Office action FINAL.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 16, 18-19 are rejected under 35 U.S.C. 102b as being anticipated by Shinobu (JP 09080246).

Shinobu teaches a device, comprising: a spacing made of a first cladding material and formed by an etch process to remove portions of the first cladding material from core regions adjacent to the spacing (fig. 3(a)); a core material filled into the core regions subsequent to removal of portions of the first cladding material from the core regions (fig. 3(b)); and a layer made of a second cladding material and formed over the core material and over the first cladding material, including over the spacing. (fig. 4(b)) (fig. 4(b)) (See, in general, figs. 2-4 and associated text).

Art Unit: 2883

Thus claim 16 is met.

Shinobu teaches wherein upper surfaces of the core material, of the spacing, and of the first material are substantially flush (fig. 4(b)). (See, in general, figs. 2-4 and associated text). Thus claim 18 is met.

Shinobu teaches wherein the core regions and spacing are patterned using a lithography technique. (figs. 2-3 and associated text). Thus claim 19 is met.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Claims 1-4, 7, 17, 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shinobu (JP 09080246).

Shinobu teaches a method, including: forming a cladding material over a substrate (fig. 2(a)); lithographically patterning (fig. 2(c)) and etching the cladding

material (fig. 3(a)) to obtain core regions and a spacing between the core regions that is made of the cladding material; and filling the core regions with a core material (fig. 3(b)).

Although Shinobu does not explicitly teach "using a chemical-mechanical process to remove excess core material formed over the core regions and over the cladding material", it would have been obvious to do so because it is notoriously well known (NWK) to remove excess core material formed over the core regions and over the cladding material using a chemical-mechanical process.

Shinobu teaches forming another cladding material over the core regions and over the spacing (fig. 4(b)). (See, in general, figs. 2-4 and associated text, i.e., the English abstract).

Thus currently amended claim 1 is rejected.

Shinobu teaches wherein etching the cladding material comprises using an etching technique. Although Shinobu does not explicitly state "anisotropic" etching, it would have been obvious to do so because it is notoriously well known (NWK) to use the various etching techniques in such applications, including anisotropic etching for the purpose of optimizing design and/or production parameters. (See, in general, figs. 2-4 and associated text, i.e., the English abstract). Thus claim 2 is rejected.

Although Shinobu does not explicitly teach "wherein filling the core regions comprises using a deposition technique", it would have been obvious to do so because it is notoriously well known (NWK) to fill the core regions comprises using a deposition technique in such applications. (See, in general, figs. 2-4 and associated text, i.e., the English abstract). Thus claim 3 is rejected.

Art Unit: 2883

Although Shinobu does not explicitly teach "wherein filling the core regions comprises using a re-flow process", it would have been obvious to do so because it is notoriously well known (NWK) to fill the core regions comprises using a re-flow process in such applications. (See, in general, figs. 2-4 and associated text, i.e., the English abstract). Thus claim 4 is rejected.

Shinobu teaches wherein lithographically patterning the cladding material includes using a mask (See figs. 2). Thus claim 7 is rejected.

Shinobu teaches a device, comprising: a spacing made of a first cladding material and formed by an etch process to remove portions of the first cladding material from core regions adjacent to the spacing (fig. 3(a)); a core material filled into the core regions subsequent to removal of portions of the first cladding material from the core regions (fig. 3(b)); and a layer made of a second cladding material and formed over the core material and over the first cladding material, including over the spacing. (fig. 4(b)) (See, in general, figs. 2-4 and associated text).

Although Shinobu does not explicitly teach "wherein the first and second cladding materials comprise a similar material having a lower refraction index than the core material", it would have been obvious to do so because it is notoriously well known (NWK) for the first and second cladding materials to comprise a similar material having a lower refraction index than the core material in such applications. (See, in general, figs. 2-4 and associated text, i.e., the English abstract). Thus claim 17 is rejected.

Although Shinobu does not explicitly teach "wherein the core regions are filled with the core material using a deposition or re-flow technique", it would have been obvious to do so because it is notoriously well known (NWK) to fill the core regions with the core material using a deposition or re-flow technique in such applications. (See, in general, figs. 2-4 and associated text, i.e., the English abstract). Thus claim 18 is rejected.

Art Unit: 2883

over the core regions and over the cladding material and further teaches that CMP and/or RIE are commonly employed in semiconductor processes.

Okada et al. (5410622) and Nurse et al. (5263111) are two examples, among a plethora of patents, that teach etching the cladding material comprises an anisotropic etching technique.

Binkley et al. (6434282), Demaray et al. (6506289), and Steinberg et al. (20030118310) show it is notoriously well known (NWK) to fill the core regions comprises using a deposition technique.

Nishimoto (5408569) and Akwani et al. (6768856) teach a reflow process which fills the core regions.

Crevasse et al. (6355184) teaches chemical mechanical polishing for planarizing glasses deposited by spin-on and reflow deposition means. Additionally, MacDonald et al. (5770465) teaches reflowing as an option to fill trenches formed in a silicon substrate.


Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael P. Mooney whose telephone number is 571-272-2422. The examiner can normally be reached during weekdays, M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on 571-272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Crevasse et al. (6355184) teaches chemical mechanical polishing for planarizing glasses deposited by spin-on and reflow deposition means. Additionally, MacDonald et al. (5770465) teaches reflowing as an option to fill trenches formed in a silicon substrate.

Art Unit: 2883

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.


Michael P. Mooney
Examiner
Art Unit 2883


Frank G. Font
Supervisory Patent Examiner
Art Unit 2883

FGF/mpm
2/16/05

Application/Control Number: 09/814,425
Art Unit: 2883

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 571-272-1562.

Michael P. Mooney
Examiner
Art Unit 2883

FGF/mpm
2/16/05